

## Executive Summary

E2580 V1 rev

### Introduction

Due to the growth of demand for power in Uzbekistan, the problem of aging infrastructure and the limited number of transmissions lines—1,850 km of 500kV lines, 6,200 km of 220kV lines, and 15,300 km of 110kV lines—some provinces experience frequent overloading, and power losses. Such bottlenecks are becoming a serious problem.

Furthermore, the south receives power from the northeast, where 70% of electricity is generated, while more than 90% of natural gas is produced in the southwest; this means that natural gas is transported to the northeast to produce electricity and then sent back to customers in the south and southwest. The problem of transporting energy in this manner is being addressed in a Government plan which will involve using local natural gas to produce power for local use, thus eliminating the need to transport it and the losses that result from this inefficient process.

To this end, the plan involves constructing two combined-cycle gas turbine (CCGT) units adjacent to the existing Talimarjan Thermal Power Plant (TPP) and one CCGT unit in Navoi Province. These new units are to be located in the south of the country to make use of the local natural gas resources.

Also, the preliminary feasibility study conducted in 2007 by Uzbekenergo, the state electricity utility in Uzbekistan, found it was necessary to expand the transmission grid with a new 500 kV transmission line between Talimarjan TPP and Sogdiana substation to meet the growing power needs in the southwest.

To support the plans of Uzbekenergo, the World Bank is proposing to finance Uzbekenergo's project proposal consisting of a new substation—a 500 kV open switchgear (OSG)—at the existing Talimarjan TPP and a 500kV transmission line from there to the existing Sogdiana substation (218 km) that will pass through the provinces of Kashkadarya (131 km) and Samarkand (87 km). The substation will be constructed adjacent to the Talimarjan TPP on land that will be transferred from the local administration to Talimarjan TPP.

The main reason to construct the high voltage 500 kV line to the Sogdiana substation with OSG 500 kV is to make the electric power system more stable, eliminate the restrictions in power supply to the Samarkand-Bukhara energy hub, supply electricity to the new consumers in the southwest, reduce transmission losses, and make the power supply more reliable for both industrial and domestic customers in Samarkand and Bukhara province—which have over four million people, 71% of whom live in the rural area. The population increases at about 2% a year.

The World Bank team reviewed the Environmental Impact Assessment (EIA) study prepared by Uzbekenergo and the design institutes involved with the project's pre-feasibility studies. The EIA was approved by the Uzbekistan State Committee for Nature Protection (SCNP).

The EIA indicated that the Adyr lands in Kashkadarya oblast are ecologically significant for birds, both resident nesting species and migratory species, and that the region is one of the key bird flight routes in Central Asia. Therefore, it recommended adoption of mitigation measures, such as a horizontal profile for the wires and use of bird diverters and deflectors, which are

widely used and accepted as good international practice for reducing bird mortality resulting from transmission lines.

In view of the potential international significance of the area as a major migratory route, the World Bank project task team engaged the services of an internationally recognized consultant specializing in avian risk issues associated with transmission lines to prepare an avian risk assessment/management study to supplement the existing EIA.

The task team and Regional Safeguards Secretariat also agreed that consistent with the World Bank policy on environmental assessment (EA, OP 4.01), the project should be assigned Category A and a supplemental and independent EA (hereafter “supplemental EA”) should be prepared to fully comply with World Bank policies related to environment. It was further agreed that results of the avian risk assessment/management study would be incorporated into this supplemental EA, including in the Environmental Management Plan (EMP).

In addition, Uzbekenergo conducted a social impact assessment (SIA) with the assistance of ADB, and to comply with the World Bank safeguards policy on involuntary resettlements (OP4.12), prepared a resettlement action plan (RAP).

This Executive Summary presents the most important points from the SCNP approved EIA, supplemental EA, and avian risk assessment/management study. It is divided into the following sections:

1. Project Objectives and Description
2. Policy, Legal and Administrative Framework
3. Review of the Existing Talimarjan TPP’s Environmental Performance
4. The Project’s Environmental Impact
5. Avian Risk Assessment
6. The Project’s Social Impact
7. Analysis of Alternatives
8. Environmental Management Plan
9. Results of the Public Consultation

## **1. Project Objectives and Description**

### ***Project objectives***

The Talimarjan Transmission Project will help improve and stabilize the power supply from the Samarkand-Bukhara energy hub, reduce losses in transmission lines, and improve the power supply in the region. Once the second and third CCGT units are operating at the Talimarjan TPP (construction is planned for 2011-2014), they will produce 900 MW of power, increasing the total generating capacity to 1,700 MW. At present, the existing 220 kV open switchgear system (OSG) is unable to effectively operate all the units (both those that exist and those being developed) to avoid emergency shutdowns.

The Talimarjan TPP capacity will increase when the two CCGT units are constructed; however, it will still be necessary to construct another 500 kV transmission line from Talimarjan TPP to the grid, to make it more flexible and reduce the possibility of emergency shutdowns.



## **2. Policy, Legal and Administrative Framework**

The legal framework for the protection and management of nature is provided by Articles 50 and 55 in Uzbekistan's Constitution. The country also passed 13 supporting laws and 55 statutes for environmental management, and is party to 13 international and regional environmental agreements and conventions on air pollution, biodiversity, climate change, desertification, hazardous wastes, ozone layer protection, trans-boundary water courses, and wetlands (the Ramsar Convention).

With respect to environmental protection, the project is subject to various national laws and regulations. The most important are:

“On the protection of nature” (1992), “On the protection and use of flora” (1997), “On the protection and use of fauna” (1997), “On atmospheric protection” (1996), “On solid wastes” (2002) , “On environmental expertise” (2000), and on “The regulation of governmental environmental expertise in the Republic of Uzbekistan” (Cabinet of Ministers' Decree No. 491 from December 2001).

The SCNP is the highest level coordinating authority for State control and inter-sectoral governance, with respect to using and reproducing natural resources. The SCNP is accountable to Oliy Majlis (the Parliament).

By the law on “Environmental Expertise,” the SCNP is obliged to pursue the following objectives:

- Manage and monitor compliance with the State's environmental impact assessment procedures
- Review and approve environmental impact assessments
- Monitor implementation of conditions specified in the environmental impact assessment approval

In compliance with Appendix 2 to the Cabinet Ministers' Decree of the RUz No. 491, paragraph 13 (December 2001), the national power transmission lines belong to Category I with respect to their environmental impact (high impact risk). The legal framework governing the construction of the OSG-500 kV and 500 kV power transmission lines is the following:

- Cabinet Ministers' Decree No.491 (December 2001) on “Confirmation of regulation of governmental environmental impact assessment;”
- “Instructions for conducting inventories on air pollution and setting air pollution standards for enterprises” (2006);
- Guidelines for calculating air concentrations of pollutants contained in industrial emissions (OND-86);
- Sanitary norms and rules (SNR) on the effects of the electric field generated by overhead transmission lines of alternating currents of industrial frequency (1984);
- SNR on noise protection, State committee on architecture and construction (1996);
- SNR No.0015-94. Maximum concentrations of air pollutants permitted in populated areas within the territory of the RUz, Tashkent (1994).
- SanPiN No. 0056-96 Establishment and maintenance of healthcare institutions of the Republic of Uzbekistan, Tashkent (1996).

Uzbekenergo prepared two EIAs for the project that were reviewed and approved by the SCNP (# 18/532z, in October, 2009 and # 18/149z, in March, 2010 for the 500 kV transmission line; # 18/192 in March, 2010 and # 18/533z in October, 2009 for OSG-500 kV). According to local environmental laws, no added approvals or environmental documents are needed for this project.

### **3. Environmental Performance of the Existing Talimarjan TPP**

The capacity of the existing Talimarjan TPP is 800 megawatts (MW). The design institute, Teploelectroproject, did the EIA for the first unit in 2000 and in 2001, SCNP approved it, confirming that the technology and environmental mitigation measures met the country's environmental standards and norms.

Within the scope of the World Bank supplemental EA, an independent consultant reviewed the environmental performance of the existing Talimarjan TPP, which must comply with environmental laws in the following areas: (a) limits on discharges to water bodies (approved in 2008), (b) limits on discharges to the atmosphere (2007) and (c) limits on waste disposal (2007). These matters are controlled by Talimarjan TPP staff and the Kashkadariya Province branch of the SCNP.

Water at Talimarjan TPP is used for generating steam, condensing low pressure steam from the turbine exhaust, and drinking. Two types of industrial wastewater are generated: heated water produced from steam condensation and process wastewaters containing oil. Heated water from steam condensation is discharged directly into the Karshi main canal (KMC) during the summer and in the winter a spray cooling system is used (see below) and the cooled waters are recycled. Process wastewaters are first treated in an industrial wastewater treatment center at Talimarjan TPP and afterwards, mixed with domestic wastewater and treated in the sanitary domestic wastewater treatment plant (WWTP). Weekly reviews of the water quality monitoring data, conducted by WWTP staff and quarterly reviews conducted by the local branch of SCNP showed that the quality of the treated water meets maximum discharges allowed for Talimarjan TPP. The “Hygienic Requirements on Quality Standards of Surface Water” provided in the SaniPiN 0056-96” are also met.

During summer, cooling waters are operated on a once-through basis and flows are in the range of 22-25 m<sup>3</sup>/second. According to the water quality data collected weekly (by Talimarjan TPP environmental experts) and quarterly (by the local SCNP branch), the temperature of the discharged water is 26<sup>0</sup>C, which is only 3 to 4 <sup>0</sup>C higher than the temperature of the intake water. This conforms to the provisions of the SanPiN No. 0056-96 on “Hygienic Requirements and Quality Standards of Surface Water” according to which the temperature of the water at the control point should not exceed that of the intake water by more than 5<sup>0</sup>C. Usually, water losses from the steam cooling cycle are approximately 2% – 3%, representing only 0.5% of the total volume of water in the KMC. However, water losses are higher (up to 10% -12%), during the winter, when a closed-circuit (spray) system is used for steam condensation. The spray system is used to minimize water withdrawal from KMC and consequently reduce the volume of hot water discharged into KMC (10 m<sup>3</sup>/second). Since the KMC experiences lower flows in the winter, the spray cooling system minimizes the impacts to any fish in the river by reducing the amount of water withdrawn from KMC and ultimately returning it heated into the river.

Based on findings from “Uzbekenergosozlash’s” (under “Uzbekenergo”) monitoring at Nuriston in November 2009, noise pollution is lower than limits set both by Uzbekistan law and World Bank requirements. Nuriston is the nearest village to the TPP site, about 500 m. away.

All types of solid waste generated at Talimarjan TPP are properly handled, according to the official document “Limit on Waste Disposal.” Scrap metals generated from the scheduled ten year overhaul and routine maintenance and repair activities are recycled in a special plant “Vtorchermet;” waste oil is recycled and reused as a lubricant at the Talimarjan TPP; waste fluorescent lamps are sent to a special licensed plant, “Ecotibbyot;” where mercury and glass are separated and each disposed according as hazardous and non-hazardous waste respectively. All other types of non-hazardous solid wastes are collected on the TPP territory and disposed of at the Nuristan city landfill.

To assess oil content of the soil in the area where oil was stored until 2004—which is 2 km away from the Talimarjan TPP--samples were collected by the Kashkadarya SNPC local branch in June 2010; the analysis of soil-monitoring data for the last three years indicated that limits were not exceeded (analysis results are presented in the Attachment of the Supplemental EA report).

No environmentally protected areas, archeological sites or historical monuments are on the Talimarjan TPP territory. The nearest is the historical center in Karshi city, which is 37 km away, which contains the Kok mosque, Abdulazaz madrasse, and Yer Kurgan settlement area, among others.

Thus, the review of Talimarjan TPP’s environmental performance showed that it operated without exceeding the allowed levels and does not have a negative effect on the environment.

#### **4. The Project’s Environmental Impact**

The environmental impact of the OSG 500 kV line at the Talimarjan TPP and 500 kV line from Talimarjan TPP to Sogdiana SS will be observed during different phases of project implementation, through construction and operations/maintenance.

##### ***Impact on air***

With respect to the impact from the construction of these lines, the main effects on air quality are expected to come from dust generated from transporting materials. Since the new line will be located far from inhabited areas, no impact from dust is expected.

##### ***Noise pollution***

Estimates for noise pollution during construction were calculated in locations closest to the source, according to Construction Norms and Rules (KMK) 2.01.08-96 “Noise Prevention.” Results showed that noise levels at the site and nearest settlement area will meet State Standards (80 dBA and 45 dBA, respectively).[2] The measures to mitigate noise pollution are recommended in the EMP. The noise caused by corona discharge, once the transmission line is operating, is within accepted limits in good weather, but on rainy days, it increases. However, the noise from rainfall masks the noise from the corona discharge. The noise level at 100 m from the last electric phase support was 17.70 dBA, which does not exceed permissible limits.

##### ***Magnetic and electric field levels***

Calculations with respect to the magnetic and electric field levels showed they are within prescribed norms. The EMP requires that these be monitored during implementation at the substation and along the transmission line to verify the calculations and thus prevent any impacts to humans, fauna and flora.

#### ***Impact on water resources***

During construction, the impact on water resources will be insignificant. Once the OSG 500kV lines are operating, the water supply (for drinking, production and fire prevention) will be from the Talimarjan TPP water pipes. Wastewater, which is expected to be insignificant, will be treated at the Talimarjan TPP wastewater treatment system. The EMP contains special measures to prevent pollutant discharges into surface and groundwaters.

When the transmission line crosses bodies of water, electricity pylons will be installed on high platforms on the both sides, in order to minimize their impact on the groundwater. The height of the pylons will ensure that they are above flood levels, thus eliminating the possibility that they could topple into the river during such natural events. During operations/maintenance of the 500 kV transmission lines, no impact on water bodies is expected.

#### ***Impact on land***

According to the terms of the project, before construction begins on the OSG line, layers of rich topsoil will be removed and placed in temporary piles under the electricity pylons. Once the construction is completed, the soil will be restored and planted. To prevent the topsoil on the slopes affected by the construction from eroding, permanent grasses will be planted, afterwards.

All solid wastes generated at the site during construction of both transmission lines will be temporally stored in special structures developed for this purpose; they will be used according to norms stipulated by environmental authorities. The general contractor will be responsible for sanitation, epidemiological and environmental conditions.

It is expected there will be no negative impacts on land resources during operations. With the OSG, liquid wastes will be generated, such as oil from transformers and switches; these will be gathered and sent to the recycling facility. Waste rags will be re-used at the Talimarjan TPP.

#### ***Impact on flora and fauna***

Construction for the OSG-500 kV line is on the Talimarjan TPP site, where there are no rare plants or animals.

Construction of the project will not affect flora and fauna in Kashkadarya Province, since it will occur along existing roads and facilities. Also, the route will not pass through areas with medicinal and indigenous plants; rather, it will run along the edge of fields to minimize potential damage to crops. The installation of the electricity towers for the 500 kV transmission lines at high elevations and in uplands along both sides of water bodies will have no negative impacts on biocoenosis and ichthyofauna.

## **5. Avian Risk Assessment**

As previously mentioned, the potential negative impact of the 500kV Talimarjan Transmission Line on birds was studied by an internationally recognized consultant specializing in avian risk issues associated with transmission lines who prepared an avian risk assessment/management study for the proposed transmission line. The international consultant collaborated with the Uzbekistan's Zoology Institute of Academy of Science (UZI). UZI has 70 years of research experience and specializes in bird-related issues in Uzbekistan and the Central Asia region. In recent years the UZI collected substantial amounts of data on migratory bird flight patterns in conjunction with their research efforts tracking avian flu spread in the region. In order to minimize avian risk from the transmission project the international consultant recommended the avian risk assessment/management *strategy* should proceed in the following three stages:

- Stage 1: Desk study to establish the likely level of project related avian risk and recommended risk management measures (to be implemented during project preparation)
- Stage 2: Baseline field monitoring program during the next bird migration season (Fall 2010) to fill any data gaps and identify any high-risk areas (e.g. associated with stop-over sites) requiring special mitigation measures;
- Stage 3: Field monitoring program to assess the effectiveness of mitigation measures on an ongoing basis

The Stage 1 Desk Study was satisfactorily completed by the international consultant as part of project preparation. Main conclusions of this study are:

- (a) the migration corridor is a broad front *without* any “channels” providing high concentrations of bird movement;
- (b) the migration corridor intersects the transmission line route for approximately 70 kilometers or about 32 per cent of the proposed transmission line length of approximately 218 kilometers;
- (c) there are no species moving through the corridor which are endangered or have sufficiently low populations that they would be vulnerable to suffering biologically significant levels of mortality from the transmission line project proposed for this corridor;
- (d) of the alternative routes considered, the selected route which is at the lower elevation avoids mountainous areas altogether so it is also the preferable one for minimizing risk to migratory birds;
- (e) the bird protection outlined in the EMP (e.g. horizontal lay-out and proper spacing of wires; use of diverters and deflectors<sup>1</sup>) are consistent with established international good practice and provide adequate mitigation of the avian risk given the nature of the migratory corridor and the species using it;
- (f) within the corridor there may be some areas presenting a higher risk for collision or electrocution of birds, such as sites near water bodies or wetlands used as migratory stop-overs or feeding or nesting sites. These can be identified during the baseline monitoring (Stage 2) and mitigation measures can be applied (e.g. increasing density of bird diverters and deflectors; minor readjustments in the corridor route).

---

<sup>1</sup> Diverters are used to reduce the likelihood of birds in flight colliding with wires; deflectors are used to discourage birds from nesting on transmission towers with the potential for electrocution

Stage 2 will be conducted prior to any construction. It will consist of a comprehensive baseline field monitoring program conducted during the bird migration season along the route to establish the existence and refine the features of the corridor, confirm or update information on the numbers of birds going through the corridor -- particularly any identified higher risk areas. Based on this information, consultations will be held with bird conservation experts regarding levels of bird mortality during the operational phase (in general and/or for any particular species of concern) which would be considered acceptable vs. unacceptable and requiring remedial action. This information will be incorporated into the EMP as a further refinement during project implementation. The preparation of the first report on the results of the field monitoring program will be the responsibility of Uzbekenergo and will be a condition of Loan Effectiveness.

Stage 3 will be a field based monitoring program assessing avian impacts (electrocution and collision mortalities) from operation of the transmission line, compared with the target maximum levels identified during expert consultations. Monitoring results will be used to implement any additional mitigating activities above those specified in Stage 2 which may be necessary to further reduce avian mortality. The Stage 3 monitoring program will also be the responsibility of Uzbekenergo and will be included in the EMP which would be an obligation under the Loan and Project Agreements.

As a covenant in the Loan Agreement, if the Stage 3 monitoring program indicates an unacceptable level of bird mortality, Uzbekenergo will consult with the World Bank on necessary further actions.

## **6. Social Impacts**

During initial social impact evaluations in September 2009, February 2010 and two rounds of public consultations in July 2010, farmers discussed the need to construct a new 500 kV transmission line and 500kV substation. Most, including adult family members who work on the farms, agreed that land acquisition for construction is unavoidable.

Uzbekenergo prepared a Resettlement Action Plan (RAP) for the project with help from World Bank specialists. Based on the RAP data, 114 farms will be affected by the construction, although there are no residences on these plots. The leasers of these farms have formal leaseholder status. Of the total, 83 will not lose more than 1% of their holdings, and the rest not more than 4%.

Compensation for loss of land and agricultural production, including removal and storage of topsoil and restoration of the affected lands, will be covered by Uzbekenergo, which will set aside funds for this purpose.

The amount of compensation will be determined by a multilateral commission led by the municipal administration along with various stakeholders, which include affected farmers. The final date for compensation payment will be set by Province decision within one month after Project funding is available to the contractor.

## **7. Analysis of Alternative Routes**

When high-voltage lines are constructed, designers try to build them as straight as possible, with few angles along the routes. However, this is technically difficult to achieve because the routes pass through developed areas.

Three routes were considered for the transmission lines. Alternative 1 (218 km) was the route chosen, as it has the lowest social and environment impact. Alternative 2 (196 km), would have been a straighter route; but, over 30% of the line would have passed through mountains, which, although shorter, would raise costs. Alternative 3 (227 km) would run along the existing 500kV transmission line of Karakul-Guzar-SS Sogdiana (more than 70% of the route would pass through mountains).

The assessment of these routes demonstrated that for environmental reasons, Alternatives 1 and 2 would have equal, minimal impact. Neither route crosses environmentally protected areas or archeological and historical sites; nor do they require resettlement actions. Alternative 1 is more feasible from the technical and economic point of view, as it will require fewer towers. Also, construction and maintenance during operation will mainly use existing roads, which means only a few minor temporary roads would need to be built. Furthermore, it is also the most preferable in terms of mortality risk to migratory birds because it is situated at the lower/flatter lands (avoiding mountains). Alternative 2 would include many sections built in the mountains, which would require construction of a large number of heavy support towers. As mentioned above, this would increase project costs. In addition, routing in mountainous areas is technically more complicated because special drilling techniques and construction of many roads would be needed. The mountainous terrain would create maintenance difficulties during line operation.

Alternative 3 has significant environmental, economic and technical disadvantages; e.g. it would pass through some parts of the Kitab natural park, which is on the International List of Conservation Areas. Further, the part of the route in densely populated areas would require a great deal of resettlement. Also, this mountainous route would increase maintenance costs during operations. As with Alternative 2, construction of many support columns would increase project costs.

Thus, Alternative 1 was considered the more effective route and is the most acceptable environmentally.

**The no-construction option.** If no 500 kV transmission line and substation are constructed, the power supply in the Samarkand-Bukhara region will continue to be inadequate and unreliable, which will hamper economic growth and decrease the quality of life. Energy losses that occur when power is transmitted over long distances will continue, as will overloading that leads to frequent blackouts.

## **8. Environmental Management Plan**

The Environmental Management Plan (EMP) details (a) the negative impacts identified in the EIA, (b) the actions required to mitigate them during the pre-construction, construction and operating phases, according to Uzbek laws and World Bank policies, and (c) the monitoring needed to confirm that the mitigation measures have achieved their objectives.

The EMP will be refined as needed during project implementation, following the baseline (Stage 2) monitoring and all EMP modifications will be subject to a “No Objection” by the World Bank.

The project will be implemented by Uzbekenergo, the executing agency. A Project Management Unit (PMU), led by a Project Director, will oversee the effort. The PMU has an environmental engineer who will work closely with the current environmental engineers at TPP. A position of environmental engineer will be created in the transmission line operation company--“Uzelectroset”-- of the Southwest Cape main administration.

During pre-construction and construction phases, environmental engineers at TPP along with the PMU’s environmental specialist will monitor the EMP at the sites. They will also prepare monthly reports for the PMU head, who will in turn submit them to the provincial branch of the SNPC and the World Bank. Construction will also be monitored by the Kashkadarya and Samarqand Provinces’ Nature Protection Committees.

As discussed before, to minimize risks to migrating birds, two special monitoring activities will be the responsibility of Uzbekenergo. The first will be conducted before construction begins and will consist of baseline field monitoring during the bird migration season along the route to refine and update some aspects of data concerning the corridor, particularly identification of any higher risk areas. The second conducted during operations, will be a field based monitoring program assessing avian impacts (electrocution and collision mortalities) from operation of the transmission line. Monitoring results obtained during transmission line operation will be used to determine whether avian mortality remains within acceptable limits and to implement any additional mitigating activities necessary to even further reduce observed impacts of avian mortality

TPP’s environmental engineers will monitor and prepare reports on the OSG 500 kV operations at the Talimarjan TPP, and submit them to the Kashkadarya Provincial Nature Protection Committee. The environmental engineer of the Unitary Enterprise (UE) “Uzelectroset” of Southwest Cape main administration will monitor conditions and write reports on the 500 kV transmission line Talimarjan TPP - Sogdiana SS operations, and submit them to Samarqand Provincial Nature Protection Committee.

The PMU environmental expert and TPP-West Cape main environmental experts will work together to implement the EMP. This will help build the capacity of Uzbekenergo staff in environmental management and monitoring, not only for this project but for the future. They will hold several training sessions for Talimarjan TPP and West Cape main environmental staff on how to implement an EMP, as well as monitor environmental impacts. This will include monitoring the effects on bird migrations once the 500 kV transmission line is operating.

The principal costs of the EMP are covered in the project budget. Based on experience elsewhere, international best practice measures to mitigate the risks to birds are well established, technically simple and inexpensive.

## **9. Public Consultation and Disclosure**

To introduce the community to the proposed project, which is considered a Category I with respect to its environmental impact, two rounds of public consultations (PCs) were held in

Kashkadariya and Samarkand Provinces. The first meetings in Karshi and Samarkand were in early July, 2010. The dates and times were published in the local newspaper *Zarafshon* and announced on television (list of participants and the minutes of both sets of meetings are included as attachments in the supplementary EA). At the meetings, questions were raised about (a) the possibility of studying another alternate route, (b) creating a protected area around the transmission lines, and (c) ensuring that the topsoil in the areas where the lines are constructed will be fertile, afterwards.

The second round of meetings were held in late July, for which dates and times were published in *Zarafshon* and *Qashqadaryo*. At these meetings, Uzbekenergo staff and the independent consultant answered questions raised at the earlier sessions. Also, information was provided about the expected environmental impacts as well as the activities planned to reduce them.

Further, during the preparation of the EIA, meetings were held with representatives of the State Committee, Provincial Committees for Environmental Protection, farmers, local administrations, local settlements, and sanitary/epidemic units.

After the baseline monitoring program is completed, consultations with local and international bird conservation experts will be held. These consultations will, if needed, provide the basis for any refinements to the EMP.

#### **10. Rational for the Project**

The EIA of the construction of the OSG-500 kV line at Talimarjan TPP and the 500 kV line from Talimarjan TPP to Sogdiana SS indicates effects will be temporary and periodic. The current information about bird migrations within Central Asia and, thus, all of Uzbekistan, indicates they will pass through the project area. Since there is little specific data on the daytime migration along the 500 kV transmission line, special studies are needed to identify the areas where the migrations are concentrated in order that the proper structures can be installed to minimize the risks.

The EMP will include measures to mitigate all potential adverse impacts on the environment, mainly those related to the air quality, noise hazard, and land resources —both during construction and operation and avian mortalities during transmission line operation.

The project is designed to provide considerable social and economic benefits for the region, improve the supply of power, and help raise living standards with minimal environmental and social impacts.